



BLM Alaska Pipeline Monitoring 1993 — Annual Report

Trans-Alaska Pipeline System
Trans Alaska Gas System
Alaska Natural Gas Transportation System

October 1993



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BLM ALASKA PIPELINE MONITORING

1993 - ANNUAL REPORT

FISCAL YEAR 1993

October 1, 1992 - September 30, 1993

STATEMENT OF AUTHORITY

This document is in fulfillment of Section 28 of the Mineral Leasing Act of 1920, Public Law 93-153, as amended on November 16, 1973, which requires: "The Secretary and other appropriate agency heads shall report to the House and Senate Committees on Interior and Insular Affairs annually on the administration of this section and on the safety and environmental requirements imposed pursuant thereto."

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
DIVISION OF MINERALS
BRANCH OF PIPELINE MONITORING

OCTOBER 1993

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TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	
BLM AND THE JOINT PIPELINE OFFICE	1
HIGHLIGHTS OF FISCAL YEAR 1993.	2-3
II. OVERSIGHT, DIRECTION AND ORGANIZATION	
HEARINGS	4
NEW DIRECTION.	4-5
ORGANIZATION	5
III. TRANS-ALASKA PIPELINE SYSTEM	
ENERGY PRODUCTION	6
FIELD MONITORING	7-8
TECHNICAL EVALUATIONS.	9-10
GEOHAZARDS	10-11
LEAK DETECTION SYSTEM	11-12
OTHER TECHNICAL.	12-13
QUALITY ASSURANCE PROGRAM	13
SPILLS	14-15
OIL SPILL CONTINGENCY PLAN	15
SPILL EQUIPMENT/MATERIALS INVENTORY	15
DRILLS	16
RESOURCES: LANDS, PERMITS AND ENVIRONMENT.	17-19
SPECIAL PROJECTS	20-21
IV. TRANS ALASKA GAS SYSTEM	
PROJECT STATUS.	22
V. ALASKA NATURAL GAS TRANSPORTATION SYSTEM	
PROJECT STATUS.	23

I. INTRODUCTION

Annual Report Fiscal Year 1993

I. INTRODUCTION

BLM AND THE JOINT PIPELINE OFFICE

The Bureau of Land Management (BLM), in partnership with the State of Alaska, has the responsibility for carrying out the Department of Interior's statutory, regulatory and contractual responsibilities (Grant of Right-Of-Way) for the Trans-Alaska Pipeline System (TAPS) and other pipelines. Other pipelines include the proposed Trans Alaska Gas System (TAGS) and Alaska Natural Gas Transmission System (ANGTS). Guiding legislation includes the Mineral Leasing Act, authorizing legislation for specific pipelines and Alaska State statutes.

BLM's delegated responsibilities were assigned to BLM's Alaska State Director, with delegation through the organization to the Division of Mineral Resources, Branch of Pipeline Monitoring.

A combined Federal/State office called the Joint Pipeline Office (JPO) was formed in Anchorage in 1990 and is currently operational. Within JPO, the following agencies are represented:

Federal Agencies

- Department of the Interior
 - Bureau of Land Management (BLM)
 - Fish and Wildlife Service (F&WS)
- Department of Transportation
 - Office of Pipeline Safety (OPS)
- Environmental Protection Agency (EPA)

State of Alaska

- State Pipeline Coordinator's Office (SPCO)
- Department of Natural Resources (ADNR)
- Department of Environmental Conservation (ADEC)
- Department of Fish and Game (ADF&G)
- Office of the Governor
 - Special Project Coordinator
 - Division of Governmental Coordination (DGC)

The JPO brings together in one place, the major agencies that permit, regulate and oversee (monitor) pipeline activities. This integrated staff works together to consider all aspects of environmental protection, public safety and pipeline integrity in processing new permit applications and for day-to-day monitoring of the TAPS pipeline and related facilities.

HIGHLIGHTS OF FISCAL YEAR 1993

Congressional Hearings

The Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, U.S. House of Representatives, held a hearing on July 14, 1993 regarding Federal oversight of Alyeska Pipeline Service Company (Alyeska) and TAPS. Alyeska is the operating company for TAPS. BLM director Baca testified before the Subcommittee.

JPO Accomplishments Since July Hearing

Additional Field Monitors

Three positions are being filled through IPA appointments.
Two more are being filled through the Federal selection process.
EPA has appointed a full-time liaison officer to JPO.
Regulatory coverage is far more extensive now.

General Field Monitoring

From July 1 to October 12, 1993 there has been a total of 5,611 physical elements and/or associated facilities of TAPS monitored under the JPO's comprehensive monitoring programs.

JPO Audits

On August 25, 1993 BLM issued a contract to Quality Technology Company (QTC) to identify technical, engineering and management issues related to TAPS.

On July 26, 1993, a cooperative agreement was signed between BLM and ADNR. The agreement provided for an investigation into the validity of complaints and allegations raised at the Subcommittee hearing regarding the Valdez Marine Terminal (VMT).

JPO has conducted two audits of operations at the VMT.

General audit conducted on July 27-28 at VMT focused on twelve areas. Six areas were identified as requiring corrective action.

On September 8-10, Alaska Department of Labor electrical inspector, on loan to JPO, audited the ongoing National Electric Code (NEC) inspection process at VMT. This also included the crude oil loading arms at the loading berths. JPO is closely monitoring the expanded list of NEC violations being disclosed by Alyeska and Fluor-Daniels at VMT.

An Inter-Agency Agreement was signed on September 28 between BLM and the Department of Energy to provide for consulting services from Pacific Northwest Laboratory (PNL) to analyze Alyeska's pipeline stress analysis work.

Other Activities

JPO ordered Alyeska to conduct an immediate audit of the operational processes which led to the shaking of an oil sump discharge pipe on a relief tank at pump station 6 on August 11.

JPO personnel have been on site to oversee one unsuccessful test and one successful test of the valving at the critical Thompson Pass section of pipeline near Valdez.

JPO demanded copies of written plans which Alyeska may have developed on down-sizing the number of personnel located at the pump stations.

Geologic Hazard Monitoring

Alyeska was notified in August to re-survey fault zones of Donnelly Dome, Denali and McGinnis Glaciers.

Line-wide slope stability review was completed this year. Slopes monitored this year used criteria set forth in the Geohazard Monitoring Plan 111. The north slope of Squirrel Creek near mile post 717 shows continual slope consolidation and heave.

BLM independently tracks the accelerations that the TAPS pipeline is subjected to with the Alaska Earthquake Information Center Weekly Seismicity Report.

JPO staff monitored a corrosion repair on a small section of mainline pipe at a steep slope at mile post 756, south of pump station 12.

Safety Related Issues

OPS tracked five cases opened since July 1: (1) A 12-inch recirculation and (2) A 2-inch drain line at pump station 10; (3) A 12-inch recirculation line at pump station 12; (4) A 12-inch line to a tank at pump station 5; and (5) Overpressure at mile post 31. Repairs were made at the first four and the cases closed.

Executive Coordination

BLM State Director Ed Spang, ADNR Special Assistant to the Commissioner, Jules Tileston, and Alyeska President, David Pritchard traveled the entire 800 mile TAPS during the week of July 19. Many of the issues raised in allegations against Alyeska and TAPS were jointly examined.

II. OVERSIGHT, DIRECTION AND ORGANIZATION

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HEARINGS

The Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce, U.S. House of Representatives, held a hearing on July 14, 1993 regarding Federal oversight of TAPS. -Chaired by Congressman John Dingell, the Subcommittee heard three panels of witnesses. Issues raised included quality control, internal communication, personnel matters, owner relationships, and regulatory oversight.

The first panel, consisting of former Alyeska personnel, testified on quality control problems and issues related to employment. The second panel, Alyeska spokesmen, outlined some of the efforts Alyeska is making to correct physical and managerial problems identified in investigations. The third panel consisted of Federal agency representatives who focused their testimony on ways in which to improve oversight of TAPS activities

NEW DIRECTION

As a result of the hearings, the BLM role in monitoring the 800 miles of TAPS was given a fresh charter from Director Jim Baca. Responding to criticism from several House of Representatives oversight subcommittees, Baca set new direction for BLM in the JPO. "This administration is dedicated to the concept of keeping our public lands as safe from environmental damage as possible," said Director Baca. "To achieve this, I have initiated a series of actions which, when taken altogether, will result in a completely revamped and pro-active approach to regulating the TAPS."

Baca appointed Dr. Jeff Zabler in BLM's Washington Office as his personal representative on all TAPS matters. Dr. Zabler stays in daily contact with BLM's Alaska State Director and other key personnel.

Baca initiated a toll-free confidential hotline (800-764-5070) for anyone who has a complaint about the operation of TAPS. So far, 42 calls have been received, raising topics ranging from environmental issues (leaking tanks) to labor questions (bringing in contractors), to complaints about government in general. About half of the callers have been anonymous. All questions are entered into JPO's data base, assigned to appropriate staff members, and followed-up to the extent possible.

On July 26, 1993, a cooperative agreement was signed between BLM and ADNR. The agreement provided for an investigation into the validity of complaints and allegations regarding the VMT as raised in testimony. Audits are to address the following issues: crude oil storage tanks, piping and corrosion; quality assurance program and quality services inspection criteria; certification for electrical workers; pressure vessel testing; safety; welding procedures, materials and welder certification; electrical "weeping" cables and cable trays; electrical equipment with correct name plates; 1990 power loss and follow-up; fire water system welds and corrosion; and fire foam system serviceability.

BLM, on August 25, hired an independent auditing firm to assess the current condition of the pipeline, and to study all environmental, safety and program issues surrounding TAPS. Quality Technology Company (QTC), a Kansas firm with a strong record in auditing high technology industries, is conducting the review. Director Baca stated the purpose of the contract was to obtain a quick third-party assessment of the current condition of TAPS. The contractor was given a free hand to do an independent review of any potential hazards to the continued safe operation of TAPS. The final report is due to the Director in November.

An inter-agency agreement was signed September 28, 1993 between BLM and the U.S. Department of Energy. This agreement provided for consulting services from Pacific Northwest Laboratory (PNL) (Battelle). PNL was hired to critique, audit, and analyze Alyeska's pipeline stress analysis. Alyeska is using a new pig which measures the curvature of buried sections of the pipeline. A pig is an electronically instrumented device that is run through the pipe along with the oil. There are a number of different kinds of pigs but the NOWSCO curvature pig carries both an inertial navigation system and a sonar system. By combining data from these instruments with fixed benchmarks, this pig measures any change from the original shape of the pipe. A pig run in June indicated a number of areas that may be under stress due to settling of the pipe in the ground. Although such places pose serious concern, there appears to be no imminent threat to the soundness of the pipeline. PNL will evaluate and report on Alyeska's mainline pipe stress analysis, methodologies, and procedures, and will provide BLM with in-house training and computer software which will permit evaluation of pipe stress from identified field conditions.

ORGANIZATION

While the above was ongoing, the JPO proceeded to reorganize, focusing additional efforts on field monitoring and audits. JPO is now organized along functional lines, with an integrated inter-agency staff. State and Federal employees work as a team which can cover all the State Lease, Federal Grant and regulatory requirements. The objective is to avoid missing "something" because of different agency jurisdictions.

With the JPO working from a detailed monitoring handbook to ensure full coverage of critical areas, the pace of audits and the demands for information in particular problem areas has increased significantly. The JPO has conducted two audits on various aspects of TAPS since the Congressional committee hearing and has scheduled others for fiscal year 1994.

Director Baca said, "We are determined to get our arms around the many issues which have arisen with regard to TAPS. We're well into the process now and are determined to succeed."

In December, 1992 the JPO took a major step forward in both efficient operation and in cooperation by moving to a Novell Network platform for our information system. The diverse JPO agencies can now communicate and coordinate using existing hardware and software. While ADEC was already attached to a network, the other agencies had been performing stand-alone computing or were attached to a Wang VS 5000, running as a file server, print server and communications device. BLM was the lead agency.

Correspondence and documents continue to be scanned as images to the Optical Disk on the WANG VS 5000. The last quarter saw 1,100 scanned documents relating to current correspondence converted to images. Earlier files are also being scanned to the optical disk so that fast access and retrieval can be realized as opposed to retrieval of hard-copy filed documents. This is a savings in time and effort and permits more efficient use of current employees.

JPO is currently receiving assistance from Alyeska and Yukon Pacific Corporation in further integrating and augmenting data processing and retrieval goals and objectives for this office.

The Monitoring Database System, created by BLM and residing on the WANG VS, has continued to perform well in capturing monitoring information. This is under review and development to improve both quality and user-friendliness.

III. TRANS-ALASKA PIPELINE SYSTEM

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ENERGY PRODUCTION

On February 9, 1993 pump station 1 metering skid received Kuparuk Pipeline's one-billionth barrel of oil for transport through TAPS.

After two years of design and installation work, the desalter and dehydrator plant at pump station 10 was placed into operation on June 6. The new desalter plant removes salts and water from crude oil before it is processed in the topping unit. The topping unit at pump station 10 produces turbine fuel for use at pump stations 9, 10, 12 and VMT. About 13,000 barrels of crude oil are processed to produce 2,900 barrels of turbine fuel. Naphtha is also produced at the topping unit and used in powering the turbine jets at pump station 10. Powering the jets with naphtha saves \$40,000 each day in turbine fuel costs at 1.75 million barrels per day throughput rate.

Alyeska throughput and shipping production for fiscal year 1993 is contained in the following table.

TAPS ENERGY PRODUCTION

QUARTERS FY-93	PIPELINE AVERAGE DAILY THROUGHPUT (bbls)	TERMINAL ACTIVITY TOTAL CARGO (bbls)	BERTH ACTIVITY TANKERS LOADED	TERMINAL INVENTORY AVERAGE WORKING INVENTORY (bbls)
First	1,728,228	152,786,381	185	5,027,907
Second	1,682,489	145,933,068	186	5,016,819
Third	1,596,371	144,941,909	176	3,696,397
Fourth	1,525,359	143,222,652	185	2,189,051
CUMULATIVE TOTAL	1,633,112	586,884,010	732	3,982,544

FIELD MONITORING

Field monitoring included weekly trips to the northern, central and southern regions of TAPS to verify and document Alyeska's compliance with environmental and technical stipulations in the State lease and Federal Grant of Right-of-Way. A total of 11,116 inspections of physical elements and/or associated facilities of TAPS were performed during FY-93 under the general and technical monitoring plans. Some elements were inspected more than once.

From July 1 to October 12, 1993 there has been a total of 5,611 physical elements and/or associated facilities of TAPS monitored under the JPO's comprehensive monitoring programs. Specific findings were:

- 1) Twenty-six elements were identified which required action by Alyeska. A follow-up monitoring and close-out inspection is required by JPO. An example would be the low-water stream crossing at pipeline mile post 187.46, which was found to be impassible for fish. Alyeska was told to repair it.
- 2) Seventy-one elements were identified that possibly needed work. These work elements were referred to appropriate agency personnel with expertise in those areas.
- 3) Future maintenance work was identified on 58 elements, but the condition was not significant enough to require immediate action by Alyeska. Example: The north slope of Squirrel Creek (mile post 717) is showing continuing slope consolidation and heave. JPO continuously monitors this slope.
- 4) Follow-up monitor inspections allowed closure of 96 elements. After careful examination by an expert, the problem with an element has either been fixed by Alyeska or is no longer seen as a potential problem. Example of an Alyeska correction: Repair of erosion at Dan Creek.
- 5) From July 1 to October 12, 1993, monitors found 5,360 elements acceptable and in conformance with right-of-way documents or permit stipulations.

Status of the Pipeline Feature Elements under the General Comprehensive Monitoring Plans 2 through 20 at year-end are as follows:

PIPELINE FEATURE STATUS					
END OF YEAR -1993					
INSPEC.	ACTION	MONITOR	CLOSE		
MEETS	BY ALYESKA	BY JPO	MONITOR	PLAN#	TITLE
SPECS	REQUIRED	RECHECK	REPORTS		
2491	18	33	98	2	Work Pad
1636	4	9	17	3	Line Pipe & Support
130	1		1	4	Pipeline River Crossings
126			6	5	River Training Structures
29			2	6	Fuel Gas Line
4	1		1	7	Tanks
9		1		8	Pump Station Oil Movement
2		1		9	Terminal
152			1	10	Valves
4				11	Communication Sites
306	5		4	12	Oil Spill Contingency Plan
1		2		13	HAZMAT
85	3	6	6	14	Mineral Material & Overburden Disposal Sites
677	8	24	17	15	Access Roads
5		1		16	Airport
6				17	Equipment & Pipe Storage
3	4	1		18	Solid Waste Disposal Sites
600	2	4	3	19	Public Access
7			1	20	Pump Station Living Quarters & Camps
6273	46	82	157	TOTALS	

TECHNICAL EVALUATION

Investigations - Anomalies/Corrosion

Two holes were found in the floor of the crude tank 10 at VMT. The holes were between one and two inches in length and approximately one-quarter inch in width. The coating barrier had been penetrated as discovered during the tank cleaning process. No evidence of leakage has been found, but a notice of probable leak was reported to ADEC.

All crude tanks at VMT are scheduled for inspection by 1994. In addition to crude tanks, a ballast tank, two diesel tanks and recovered crude tank will be inspected as part of the 1993 season. Tanks need to be isolated, drained and vented in preparation for cleaning, inspection and applicable repairs.

Corrosion found in the tank floor of crude relief tank 200 at pump station 10 included six small holes. Several of the holes are believed to be the result of materials left beneath the tank floor during original construction. The annular ring was found to be in good condition. Epoxy paint coating inside the crude tank was intact and no crude leaks were found. Minor spills did result from high pressure wash. Spills were cleaned up and reported to appropriate agencies. The entire tank floor was replaced, which took three months to complete. A cathodic protection system was installed.

Tank 200 is one of 12 along the pipeline that is used to help maintain line balance during surges or reductions (shut-down) in oil throughput. The tank has been used to feed crude to the topping unit at pump station 10. The topping unit is a small refinery that produces fuel for pipeline operations.

Various pigs were run through the fuel gas line (FGL) that supplies natural gas for turbines powering pumps at the Northern District pump stations. On April 20 and April 23, an eight-inch Enduro geometry pig was launched from mile post 34 to pump station 4. Cleaning scraper and dummy pigs were sent through the line a few days later to prepare for the VETCO magnetic flux leakage corrosion pig launch on April 29. Data from the VETCO pig run will be used to locate field confirmation digs for pipeline sections that might require repair due to corrosion. This is the first time the fuel gas line was pigged for corrosion between mile post 34 and pump station 4 since operations began in 1977. A 10-inch VETCO corrosion pig was run in 1990 between pump station 1 and mile post 34.

In the section of the pipeline near Thompson Pass, there is approximately 2,000 feet where the pipeline does not flow full of oil due to throughput and the descent from Thompson Pass. Alyeska utilized procedures to initiate a "packed line" (full of oil) on May 20th when the curvature pig detection tool was run in this same section of line. This resulted in high vibration at the VMT East Metering facility and a resultant leak of crude oil. Since then, Alyeska developed operating procedures to completely "pack the line" and allow full pig data collection coverage by the pig to gather data for the length of the pipeline from pump station 10 to Valdez. Subsequent to this pig run, the NKK pig left pump station 10 on August 17 and arrived at the VMT on August 18, 1993 without incident. New "pack line" procedures were utilized to ensure full line conditions, which resulted in no metering piping vibration and no resultant oil leakage. Analysis of the pig data will not be available for approximately six months.

The NOWSCO curvature pig was launched through the 48-inch pipe to measure strain in the mainline pipe. The instrument pig run began May 8, 1993 at pump station 1. The second pig run was completed in September from pump station 10 to Valdez. The September pig run was used to evaluate the performance of the pipe at the mainline refrigeration Unit 2 segment and Salcha River.

Corrosion investigations and repairs are underway along the mainline pipeline. Excavations at mile post 775 and 776 identified by data from the corrosion detection pigs were completed. At mile post 775, work involved placing a 32-inch lengthwise sleeve over a mechanical gouge. Installation of remedial anodes at seven sites in the area was completed. Zinc ribbons used as anodes were replaced with magnesium anodes, which are less susceptible to passivation caused by mineral deposits in the soil. At mile post 756 a "shelf" on the 45 degree slope had to be constructed before work could begin. Pipe was exposed, old coating removed and pipe cleaned and surveyed before re-coating work started. Sleeving was not required, but pipe was re-primed and a new protective coating applied before it was reburied. All work was completed by July 15, 1993.

The history and number of TAPS corrosion investigations are outlined below. Alyeska anomaly investigation activities performed in fiscal year 1993 are also depicted in cumulative totals.

INVESTIGATIONS	1988 - 1991 ANOMALIES/ CORROSION IDENTIFIED	FY-92 ANOMALIES/ CORROSION IDENTIFIED	FY-93 ANOMALIES/ CORROSION IDENTIFIED
Above Ground	*	20/2	5/0
Below Ground	*	62/35	101/61
TOTALS	716	82/37	106/99

*Prior to FY-92, records did not differentiate between above and below ground investigations

GEOHAZARDS

The development of the Technical Geohazards Monitoring Plan 111 was completed this year. The geohazards plan assesses the dangers to the TAPS pipeline from earthquakes, fault movement, slope instability and surging glaciers. The plan describes the procedures to be used for both the audit of Alyeska geohazard data in the office and the monitoring methods to be used in the field. Guidance, in the form of checklists is used for monitoring procedures.

New earthquake monitoring software became operational on December 16, 1992 at the Operation Control Center in Valdez. The software, called DRQUAKE estimates the severity of earthquakes that occur along the TAPS route, determines if the pipeline system should be shut-down, and provides direction for post-earthquake inspections. The new DRQUAKE System was successfully triggered by an earthquake of Richter Local Magnitude 5.0 on May 13, 1993 (as reported by the Alaska Earthquake Information Center). The earthquake's epicenter was located 70 kilometers from the TAPS. Records from Alyeska indicate that the earthquake monitoring system performed as planned.

BLM reviewed Alyeska's data documenting the 1992 fault monitoring surveys for the Donnelly Dome, Denali and McGinnis Glacier fault zones. The data clearly documents that the fault monitoring zones are stable within stipulated criteria. Visual inspection of the zones this year show no signs of fault movement. Alyeska will resurvey the fault zones in late October or early November of 1993. The results of these surveys should be available by early 1994.

The Fels, Castner, Canwell, Worthington and Black Rapids Glaciers were evaluated before pipeline start-up as presenting a possible hazard to the pipeline. BLM reviewed Alyeska's glacier monitoring reports for 1988, 1990 and 1992. The reports found no significant change or ice-dammed lakes. The Black Rapids Glacier is the only glacier which has surged in historic time (1930). BLM found that a comparison between 1989 and 1992 photo series of Black Rapids Glacier revealed no significant changes. The terminus of the Black Rapids Glacier is approximately 5.5 miles from the TAPS.

Alyeska's "1992 Line-wide Slope Stability Review" was reviewed prior to the start of this year's field monitoring program. Slopes were monitored using criteria set forth in Geohazard Monitoring Plan 111. The slope near mile post 717 is showing continuing slope consolidation and heave on the north slope of Squirrel Creek. BLM is continuing to closely monitor this. A review of the slope stability in the vicinity of Treasure Creek at mile post 442 was completed this year. The analysis included data from JPO field monitoring and review of Alyeska engineering reports. The area is exhibiting slow mass movements in a direction parallel to the fall line of the slope at a rate of two inches a year. Current data indicates that the rate of movement is constant and may have been so since pipeline construction. Alyeska's monitoring of the slope is continuing with the help of instrumented boreholes and area-wide Global Positioning System surveys.

Two sites (mile posts 781.14 and 782.6) where the pipeline is buried have been identified as sites of re-occurring rock slides. The new NOWSCO curvature pig data was used to check for the effects of excessive overburden. No problems were noted. The observed ovality appears typical for buried sections of the pipeline.

LEAK DETECTION SYSTEM

In 1991 Alyeska contracted with two firms to examine a portion of the current leak detection system, and to propose improvements. As a result of those studies, a contract was signed with Scientific Software-Intercomp, Inc. to develop a transient volume balance leak detection system. That work is underway and, although behind schedule, is making progress. The projected completion date is in 1994.

The first five recommendations listed in the Implementation Plan for Enhancements to Trans-Alaska Pipeline System Oil Spill Contingency Plan - Pipeline are as follows:

1. Develop a simulator for use in training.
2. Segmentation of the pipeline system in LVB* methodology.
3. Include a TAPS hydraulic model in the LVB methodology.
4. Evaluate existing software as a supplement to the LVB for dynamic conditions, and establish confidence level/threshold values for various time intervals and operating conditions, such as steady-state versus transient.
5. Enhance ability to calculate leak location.

In 1990 Alyeska solicited bids from companies with expertise in the field of leak detection software and related systems. The contract required an examination of the existing line volume balance system (Recommendation 4), and propose development of improved leak detection software and simulator (Recommendations 1, 2, 3 and 5). Two companies were chosen in the competition. Proposals from those companies were received and analyzed during 1991. As a result of those reports, Alyeska started negotiating with Scientific Software-Intercomp, Inc. (SSI) to develop a transient line volume balance leak detection system and simulator. While the proposed system may not lower the sensitivity below that of the current LVB leak detection system, it promises much faster detection times.

Negotiations produced a contract which was signed in mid-summer 1992. SSI undertook the work in three phases. Phase one included development of the "hydraulic engine", the model that the software would use to simulate the fluid flow within the pipeline. Only if the model produced in phase one is acceptable, will the project proceed. Phases two and three will be the design, development and installation of software to implement the leak detection system and simulator. The original schedule called for completion of phase one by the end of January 1993. Since that time, some of the design and coding work has been moved from phase two to phase one, to enhance testing of the model. While progress has been made in phase one, there have been delays because of problems related to modelling a zero flow rate/empty pipe scenario and personnel commitments for other projects. As a result, phase one is now expected to be complete in November or December of 1993. The completion date for the entire project, if phase one is successful, will be in 1994.

* Line volume balance (LVB) system compares the total input of the line to the total output from the line. Because of changing conditions in the pipeline flow and drift of instruments, this volume balance is seldom zero, and therefore is compared to a long term trend, calculated from the preceding volume balance calculations. Under reasonably steady operating conditions, the LVB is expected to have a nominal accuracy of about 3,000 barrels per day over a 24-hour period.

OTHER TECHNICAL

During an Alyeska inspection program at pump station 12, damage was discovered at the top of a 12-inch pipe and pipe fitting. The damage appears to have been caused by the impact of a jackhammer during a previous excavation. Depth of the gouge was measured at 0.328 inches, with a length of three inches. Pipe wall thickness at this location is 0.39 inches, where relief valves at that location vastly reduce pipeline pressure coming into the pipe. A valve locked in the "open" position was an immediate action taken to ensure that the pressure in the line would not rise above 20 psi until repairs were completed.

A natural gas leak on a six-inch natural gas line was discovered by the presence of small bubbles on the surface of the soil at pump station 2. After the line was excavated, the leak was found at a service valve. Cause was attributed to years of freezing and thawing, which moved the soil surrounding the gas line causing some fittings to begin leaking. Another fitting was found to be leaking on a three-fourths-inch vent connection on the six-inch natural gas supply line. Pump station 2 experienced shutdown for less than two hours on September 17. This event coincided with a crude oil production slowdown while ARCO tied in an expansion module on the North Slope. Production dropped to 1.34 million barrels of crude oil that day. Production was cut five percent while the line was being fixed.

During Alyeska's routine valve winterization process, a small leak at a valve on an 8-inch natural gas fuel line was discovered near pump station 4. The leak was attributed to a cracked fitting on the valve. The fuel line was bypassed during repairs. No damage to the environment or safety problems were experienced as a result of the leak.

OPS performed a surprise audit of Alyeska's Nordale Yard in Fairbanks. Certification records for all hydrotested pipe stored at the facility were inspected. Records are kept for several sizes and types of pipe (both gas and crude oil). Pipe sizes range from four-inches to 48-inches in diameter. Records were examined and cross referenced to ensure that all the paperwork in the files matched the information on the pipe. No discrepancies were found during the audit.

Breakout tank venting at pump stations are under review by Alyeska and EPA. Air emissions from tank venting and its impact on health and safety of workers, neighboring communities and the environment will be investigated. There are ten breakout tanks along the pipeline, each holding 55,000 barrels. The only exception is a 150,000 barrel tank of crude oil at pump station 5. Relief breakout tanks were not used for any planned activities during the investigation. Pump station 1 balance tanks were used to the extent possible for planned activities. On the basis of Alyeska's research, the following conclusions were presented to EPA: (a) No indication of risk to employee health and safety (Benzene concentrations are within limits set by OSHA); (b) No adverse impact to the environment as ozone non-attainment is not an issue in the location of company operations and rapid dispersion prevents the emissions from impacting local communities; and (c) Comprehensive analysis regarding regulatory compliance and the use of the breakout tanks shows that these operations have been consistent with Federal and State regulatory permit requirements throughout the pipeline's history.

ADEC and EPA performed an unannounced inspection at the VMT on April 14. A joint agency inspection was held to determine compliance with hazardous waste management regulations at the terminal. Hazardous waste regulations are required by the Federal Resource Conservation and Recovery Act (RCRA). Inspectors identified several items that needed correction in order for Alyeska to be in compliance with RCRA regulations. Alyeska began corrections immediately.

QUALITY ASSURANCE PROGRAM

Alyeska has proposed a three tier Quality Assurance Program for compliance with the Grant of Right-of-Way Section 9. Although portions of the various tiers have been approved by the JPO, the complete quality program has not been approved. The recent audit by BLM through Quality Technology Company (QTC) has verified several deficiencies which need to be added to the program for compliance with Section 9 of the Grant. The JPO will continue to vigorously pursue the development and implementation of a complete quality program.

SPILLS

A total of 16 soil contamination sites under the liner at the east tank farm at the VMT have been reported to JPO. ADEC was involved in the investigation project from the outset, approving plans, making inspections and receiving regular reports from Alyeska. An Alyeska official reported that water draw sumps and catch basins within the containment cells have apparently caused the contamination. Repairs to water draw sumps in 1991 did not solve the problem and operational changes have been made to reduce potential leaks. Appropriate remediation for the contaminated soil considerations are: (a) Bioventing or pumping oxygen into the contamination zone to help micro-organisms to attach the hydrocarbons contained in the soils and (b) Pumping and treating ground water that lies on the bedrock in the contaminated areas. Reports should be available by the first of October.

Major shipping interests in TAPS trade, in cooperation with TAPS owners, recently began a study of oil spill prevention and incident response capabilities for TAPS trade tankers within Prince William Sound and in the open ocean areas off southeast Alaska. A four-person task force will be evaluating previous organizational studies, reviewing State and Federal regulations and meeting with people inside and outside Alyeska to develop final recommendations in approximately four to six months. Task force members include: Chairman, Ed Robinson-ARCO; Tim Plummer-Valdez Terminal Marine Manager; George Murray-Exxon; and Alan Duggins-BP.

Crews responded to a leak found at check valve 29A, mile post 161.6. One-hundred fifty gallons of crude oil leaked into a concrete vault. No oil escaped outside the vault. The cause was a faulty check valve in a grease-fitting tube and loose cap.

On June 1, as a part of Alyeska's pipeline inspection program, a 50-70 gallon residuum oil leak was discovered between a block valve and the mainline pipe. At that juncture, residual oil is returned from the North Pole refineries to TAPS. More than 80 cubic yards of contaminated soil was removed from the site. The valve is located in a residential area of the TAPS mainline right-of-way several miles east of the refineries. A water sampling program was conducted in near-by residences. The six-inch residual block valve and six-inch residual check valve will be replaced, using a stopple and bypass system.

Reported spills for fiscal year 1993 are summarized below:

SPILL TYPE	GALLONS	NUMBER OF SPILLS
Turbine/Gasoline Diesel Fuel/JP 4	14145.62	110
Hydraulic Fluid/Lube Oil	226.25	96
Crude Oil	510.35	84
*Misc.	1160.43	119
TOTALS	16042.65	409

*Misc Spills reported include: brine, antifreeze, oil and water mix.

Spills have been cleaned up or are actively being cleaned up according to BLM and ADEC approved plans.

Reported spill volumes range from traces (one-half cup = .0312 gallons) to a 12,500-gallon diesel spill at the VMT. This large spill was contained in a "sump" designed for this type event. No fuel escaped containment.

OIL SPILL CONTINGENCY PLAN

The pipeline oil spill review committee will continue to meet as needed to update the pipeline Oil Spill Contingency Plan (OSCP), focusing on environmental protection and oil spill prevention and response. The committee provides a forum for resolving issues relevant to contingency plan approvals and for meeting the requirements of existing and impending law, regulation, the Federal Agreement and Grant of Right-of-Way, and the State Right-of-Way Lease. The continuance of the JPO pipeline oil spill review committee supports the concept that the pipeline OSCP is a dynamic, working document responsive to technological advances and evolving regulations.

OSCP meetings numbers 72 through 84 were held during fiscal year 1993. Minutes of those meetings are on file at JPO.

New volumes of OSCP Section Plans were approved by all agencies concerned and published in April 1993. A revised copy of OSCP General Provisions was sent to BLM in August for review. Comments, including a request for minor changes and modification, were sent to Alyeska. At the close of fiscal year 1993, BLM awaits changes and revisions.

SPILL EQUIPMENT/MATERIALS INVENTORY

During the first quarter of fiscal year 1993, JPO staff, consisting of BLM and ADEC, jointly inventoried all spill materials and equipment at all pump stations located along TAPS. With the exception of pump station 12, all others were satisfactorily stocked with appropriate equipment and materials and located within warm storage quarters. Discrepancies at pump station 12 were immediately corrected, as verified by a BLM Field Monitor. ADEC inventoried all line-wide oil spill materials and equipment again during the third quarter of fiscal year 1993 for requirements with the OSCP. The inventory results concluded that all materials and equipment were found to be in conformance with the approved OSCP.

DRILLS

Nineteen drills were held, reported and recorded by BLM's Branch of Pipeline Monitoring. Quarterly summaries during fiscal year 1993 are outlined below:

SUMMARY - DRILLS

QUARTERS/ NUMBER OF DRILLS	TYPE OF DRILLS (SIMULATED)	LOCATION	COMMENTS
First Quarter 4-Drills	1-Salt Water 1-Pipeline Rupture 1-Leak Check Valve-LVB 1-Table Top Leak	-Valdez Harbor -Ruby Creek -Check Valve 10 -Becky Creek	-JPO Emerg Room -Pump Sta 8 & 9 -Line-Wide Resp -North Dist. ICS Response
Second Quarter 6-Drills	1-Equipment 2-Pipeline Sabotage 1-Table Top 1-ICS Function 1-Refinery-Meter	-Pump Station 12 -Sag River -Kanuti River -Prince William Sound -Mile Post 450 -Petro Star Refinery	-JPO Office -Oil Under Ice -Line-wide Drill -BLM & Alyeska -ICS Test-Trial -Joint Drill
Third Quarter 4-Drills	1-Table Top 3-Response Drills	-Valdez Arm -Pipeline Phelan Creek -Prince William Sound -Yukon River	-Vessel Grounding -InterAgencies -Simulate Sabotage -Two Boats Out of
Fourth Quarter 5-Drills	1-Check Valve 1-Oil Tank Spill 1-Table Top 1-Check Valve 1-Pipeline 45.5	-Olson Lake Creek -Valdez Terminal -Pump Station 1 -Sag River -Summit Lake	-Pump Sta 5 & 6 -Alyeska/Coast Guard & JPO -ICS Train Drill -APSC & Clean Seas -Pipeline

An exercise was designed by Alyeska and U.S. Coast Guard to establish flight standards for using Airborne Dispersant Delivery System (ADDS Pack) aboard Coast Guard C-130 aircraft. Alyeska's ADDS Pack experts trained with Coast Guard C-130 aircraft experts for three days in thoroughly testing, adjusting and practicing operating procedures. On August 11, 1993, a team of Alyeska and U.S. Coast Guard personnel flew ADDS Pack on a C-130 aircraft and released the dispersant during the exercise. Ultimately, operational procedures will be used by all Coast Guard C-130 air crews nationwide when flying a dispersant mission with an ADDS Pack.

RESOURCES: LANDS, PERMITS AND ENVIRONMENT

Land Transfers

On June 9, 1993, a patent was issued for nearly all remaining lands selected by the State of Alaska south of the Yukon River. The area is located in the vicinity of TAPS pump station 6 and traverses southerly through the Hess Creek area, encompassing approximately a 13-mile segment of TAPS. The only remaining pipeline corridor land not yet conveyed to the State of Alaska is in one township located immediately south of pump station 6. That township will be conveyed by November 1, 1993.

Waivers of Administration

ANILCA Section 906 (1)(4) states, in part:

Where the lands tentatively approved do not include all of the land involved with any ... right-of-way ... issued or granted, the administration of such ... right of way ... shall remain in the United States, unless the agency responsible for administration waives such administration.

Administration was waived by the State Director for a portion of TAPS right-of-way from the area six miles south of the Yukon River southerly through the Hess Creek area. The documents were signed by the State Director on June 28, 1993.

RESOURCES: LANDS, PERMITS AND ENVIRONMENT

RESOURCE TYPE	BLM ACTIONS	DESCRIPTION
Right-of-Way Grant	1 - Issued	Access Road 108 APL-5
Right-of-Way Grant	1 - Modified	Modified: Adds Atigun Re-route
Temporary Use Permit	2 - Issued	Corrosion Dig-Phelan Creek
Temporary Use Permits	37 - One-Year Extensions	Variety: Solid Waste Disposal; Pipe Storage Yards; OSCP Sites, Airstrip, etc
Temporary Use Permits	8 - Transferred	State of Alaska
Right-of-Way Grants	50 - Transferred	State of Alaska
Temporary Use Permits	2 - Modified	New Descrip: Oil Spill Containment Sites & Line-wide Corrosion Digs
Temporary Use Permits	6 - Terminated	Effective 2/8/93 & 3/11/93
Environmental Assessments	3 - Completed	-R/W Amend Yukon River Cross -Dietrich River Spur Dikes -OMS 30-2R Dickey Lake

MINERAL MATERIAL SALES

MINERAL MATERIAL SITES	BLM ACTIONS	DESCRIPTION
Sales	Transferred 14 Contracts	To State Of Alaska
OMS 56-3	Revenue \$5,000	10,000 Cubic Yards Pit Run Gravel
OMS 112-3.1	Revenue \$5,500	10,000 Cubic Yards Rip Rap
OMS 112-3.1	Revenue \$33,750	45,000 Cubic Yards Rip Rap
OMS (7-Sites)	Revenue \$59,200	82,000 Cubic Yards Rip Rap
OMS-56-3	Revenue \$5,000	10,000 Cubic Yards Pit-Run Gravel
OMS 105-3R	Revenue \$2,250	3,000 Cubic Yards Pit Run Gravel

SPECIAL PROJECTS

Remote Gate Valves

Pump Station 10 Remote Gate Valve False Signal Closes Valves

On June 29, a false alarm at remote gate valve (RGV) 98 was triggered by a faulty converter which supplies power to the valve control system. Several nearby valves were closed for thirty minutes. Throughput was not affected.

Operator Error Causes Pipeline Shutdown

About 30 miles north of Glennallen, an electrical project installing controls for the mainline refrigeration unit caused the nearby RGV 98A alarms to go off and the system to shutdown. The electronically-operated valves are designed to shut automatically in the event an RGV begins to close. The Auto Logic software controlling the RGVs worked as planned by signaling all RGVs in the section to close at the same time, while idling the affected pump station. This protects the pipeline against hydraulic surging and overpressure.

There were two instances when TAPS RGVs required maintenance by Alyeska in 1992. Such occurrences were not covered in the 1992 Pipeline Monitoring Annual Report.

In June 1992, RGVs required maintenance when Alyeska initiated pigging procedures and the manual operator on check valve 16 would not raise the clapper. This was immediately repaired so pigging of the pipeline could proceed. The damaged gear box had not affected normal operation of check valve 16, as the clapper would close by gravity whenever oil flow stopped. This would happen during a shutdown for an oil leak.

RGV 73 malfunctioned and closed without command in August 1992. This caused pipeline shutdown and resulted in an overpressure of the pipe. Alyeska initiated a line-wide review of all RGVs, which resulted in a program to manually operate RGVs 44, 45, 47 and 49, since malfunction of these valves could over stress the pipeline. These valves were physically manned on a 24-hour basis to allow manual closure of the electrical switch and normal operation by the Operation Control Center in Valdez. Alyeska began negotiations with a supplier to build new RGV gear boxes for installation in 1993 at all valve locations identified where the pipeline could be overpressured.

Local RGV Supervisory System (LRSS) was tested at RGV 73 on February 9, 1993. A JPO representative observed the test from 9:30 AM to 7:30 PM. During this time, it was demonstrated that if an uncommanded signal instructed the valve to close, the LRSS would override this signal, thus preventing an uncommanded closure.

A proto-type gear box was developed to slow the valve closure time for critical RGVs. This prevents overpressuring the pipeline during an emergency shutdown. In the interim, four RGV valves were manned to actuate the valves in case of an oil spill to ensure the pipeline was not accidentally over stressed.

RGVs 44, 45, 47, and 49 have been satisfactorily fitted with remote command control systems and are no longer being physically manned. Work began on other RGVs identified for installation of new LRSS' and were completed by the end of June 1993. New gear boxes which control the speed of RGV closure are scheduled for installation in 1994, as they are provided by the supplier.

Sag River Dikes Repaired

Sag River's worst flood of record required repair of three dikes. The area is located north of pump station 2 at mile post 47. High water caused the river to break out of its channel and cut into the bank dangerously close to the buried pipeline. Repairs were completed to the spur dikes in late April and took more than 35,000 cubic yards of gravel and 6,000 yards of (2-foot diameter rock) rip-rap. Liner material was added to the exposed river bank. Also 13,000 pound gravel-filled bags were placed behind the rocks as a back-up. The newly-constructed dikes were breached during the 1993 Memorial Day week-end, due to break-up flooding before consolidation could occur to the winter constructed gravel materials of the spur dikes.

Timber Sales - Pump Station 12 Area

During the Summer 1993, the BLM's Branch of Pipeline Monitoring participated with BLM's Glennallen District Office in setting up timber sales in the Little Tonsina drainage between Glennallen and Valdez. An environmental protection specialist from BLM helped identify sale areas, placing a priority on the pump station 12 area, approximately 60 miles north of Valdez. The pipeline workpad is proposed for access to sale areas at pipeline mile posts 730 and 734. Logging of beetle-killed white spruce will be allowed in the first quarter of fiscal year 1994.

Air Quality Permit Compliance - Valdez Marine Terminal

BLM is working with ADEC in preparing an audit for air quality permit compliance at the Valdez Marine Terminal. An on-site audit will be scheduled in October 1993.

Revegetation Projects - Atigun Project and Sten Creek

BLM continues to monitor the progress of willow revegetation in the Atigun project area near check valve 29 and at Sten Creek north of the Brooks Range. Survival of planted materials at check valve 29, which is a dry site, subject to occasional seasonal flood erosion, has declined since 1992. Success rates along Sten Creek and at the ponds near the Atigun Camp pad continue to be high.

BIA Seeks BLM & Alyeska Aid For Fuel Spill At Bethel, Alaska

U.S. Bureau of Indian Affairs called on BLM's Environmental Protection Specialist and Alyeska's Oil Spill Response Specialist to aid in clean-up of a 110,000 gallon fuel spill at Bethel, Alaska. A fuel pipeline froze, split and caused a storage tank to drain near BIA's boarding school. Oil was contained in a mile-long section of hillside drainage by snow, ice and containment boom. More than 60 percent of the oil was recovered.

IV. TRANS ALASKA GAS SYSTEM

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PROJECT STATUS

Yukon Pacific Corporation (YPC) continues to negotiate with the owner companies for the purchase of North Slope gas reserves, as well as with buyers in Pacific-Rim countries for gas sales.

During the year, YPC applied to amend the right-of-way grant to permit the construction of a 42-inch diameter pipeline versus a 36-inch line. The environmental assessment (EA), May 1993, for the amendment to the larger diameter pipeline resulted in a finding of no significant impact. BLM issued an amendment to the right-of-way grant on June 23, 1993.

The Federal Energy Regulatory Commission (FERC) released the draft Environmental Impact Statement (EIS) for YPC's liquefied natural gas terminal facility site at Anderson Bay. The comment period on the draft EIS ended July 6, 1993. The final EIS has not been released.

V. ALASKA NATURAL GAS TRANSMISSION SYSTEM

V. ALASKA NATURAL GAS TRANSPORTATION SYSTEM

PROJECT STATUS

Effective December 1, 1992, Northwest Alaskan Pipeline Company relinquished 14 Temporary Use Permits held since 1980 for airstrips and temporary construction camps. Northwest also requested release of its \$150,000 performance bond, which was also effective on December 1, 1992. Since this action, Northwest Alaskan Pipeline Company has taken no new action regarding its project. The ANGTS project continues to be in a "Hold" status. The only interest held by Northwest in Federal lands is the right-of-way for the mainline pipe.